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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,966	01/16/2004	Diane K. Stewart	F125	6517

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EXAMINER	
OLSEN, ALLAN W	

ART UNIT	PAPER NUMBER
1763	

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06/19/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Advisory Action Before the Filing of an Appeal Brief	Application No. 10/758,966	Applicant(s) STEWART ET AL.	
	Examiner Allan Olsen	Art Unit 1763	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 29 May 2007 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:

- a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
 b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
 (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
 (b) ☐ They raise the issue of new matter (see NOTE below);
 (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
 (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).

4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
 5. ☒ Applicant's reply has overcome the following rejection(s): provisional double patenting.
 6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
 7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
 The status of the claim(s) is (or will be) as follows:
 Claim(s) allowed: _____.
 Claim(s) objected to: _____.
 Claim(s) rejected: 1-12, 21 and 22.
 Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
 9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing of a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
 10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because:
See attachment.
 12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). _____.
 13. ☒ Other: PTO form 892 - Notice of References Cited.

Allan Olsen

Allan Olsen
 Primary Examiner
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ADVISORY ACTION

An additional search revealed the prior art made of record on the attached PTO form 892. US 7172839 (Sugiyama; Yasuhiko et al.), US 6991878 (Kanamitsu; Shingo et al.) and US 6897157 (Liang; Ted et al.) appear to be of particularly relevant

Response to Arguments

Applicant's arguments filed May 29, 2007 have been fully considered but they are not persuasive.

Applicant argues (with additional emphasis added):

Musil does not teaches repairing opaque defects of a lithography mask by directing an electron beam and XeF₂ toward a region of a quartz substrate into which Ga⁺ ions have been implanted.

Musil teaches the removal of opaque defects--composed, for example, of tungsten, tantalum nitride, or other molybdenum-silicon compounds--from a lithography mask. See Musil at [0054] and [0055].

While the reference does discuss an optional step where some degree of gallium implantation could occur, see Musil at [0048], the reference does not teach any method whatsoever of repairing this gallium implantation should it occur.

Further, even if Musil did teach a method of restoring transparency for quartz material having implanted gallium it still would not teach all of the limitations of the claimed invention because Applicants' claim 1 requires that the transmission of the quartz material be substantially increased while the thickness of the quartz material is substantially unchanged.

In Musil, the electron beam is used to completely remove the material causing opaque defects. The reference clearly states that, even when the optional FIB milling step is used, the electron beam is still used to remove the implanted layer of approximately 20-40 nm of material. Musil at [0048]. In other words, Musil teaches increasing the transmission by removing the entire layer of implanted quartz material. This is hardly the same as leaving the thickness of the layer substantially unchanged. Not only does Musil fail to teach all the limitations of claim 1, Musil's teaching is directly contrary to Applicants' claim 1.

The same is true for Stewart. Nowhere does Stewart mention increasing the transmission of the quartz material without changing the thickness of the layer. Not only does Stewart directly incorporate Musil, Stewart also repeatedly-refers to repairing any implantation defects by completely removing the gallium-implanted layer. See, e.g., Stewart at [0036]

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and [0044].

In fact, the Examiner expressly acknowledges that Musil does not explicitly teach the limitations of claims 6-8, 10-12, and 21-22 (Office Action of Feb. 28, 2007, at p. 5) but nevertheless still rejects these claims under §102. According to the Examiner, because Musil obtains results that meet the result-limitations in the claims, it follows that "comparable" operation parameters were used in Musil. "Comparable" limitations, however, are not enough to show § 102 anticipation. Instead, § 102 anticipation requires that each and every element as set forth in the rejected claim be present in the reference, either expressly or inherently. Further, a claim limitation is inherent in the prior art only if it is necessarily present in the prior art, not merely probably or possibly present. Rosco v. MirrorLite, 304 F.3d 1373, 1380, 64 USPQ2d i676 (Fed. Cir. 2002) (emphasis added). In other words, the exact limitations in Applicants' claims must be expressly or necessarily present in the reference. For Applicants' claim 1-12, it is certainly not inherent in Musil that the transmission of the quartz material be substantially increased while the thickness of the quartz material is substantially unchanged. This limitation may be possibly present, but it is obviously not necessary since the Musil reference specifically mentions an example where the limitation is not present. In [0048], Musil describes an example where an implanted layer 20-40 nm thick is completely removed by the electron beam and etching gas. Removing the entire layer is obviously not the same as leaving the thickness substantially unchanged.

Claims 21 and 22 both contain the limitation that the transparency of the substrate is restored by etching the substrate by less than 5 nm. This limitation is simply not found expressly in either Musil or Stewart. Also, the limitation cannot possibly be inherent in either reference since Musil and Stewart (by way of incorporating Musil by reference) both describe an example where transparency is restored by completely removing a layer of implanted quartz material 20-40 ~ thick by using the electron beam and etching gas. Even if the limitation is possibly present, it is not necessarily present, and thus the § 102 anticipation is not proper.

Regarding applicant's position that Musil teaches removing 20-40 nm of an implanted layer, the examiner notes that nowhere does Musil teach that the 20-40 nm that is being removed is an implant layer. Musil teaches uses a Ga⁺ ion beam to remove all but 20-40 nm of an opaque defect such as excess deposits of chromium or tungsten ([0006]). Musil teaches removing the last 20-40 nm of the metallic opaque defect with an electron beam. **This electron beam etching does not etch the transparent quartz substrate.** Due to the first step, wherein Musil uses a Ga ion beam to etch away most of the metallic opaque defect, there is a little shallow implantation of Ga ions into the transparent quartz substrate. In the second step Musil teaches etching

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away the 20 - 40 nm of overlying opaque material with an reactive gas enhanced electron beam etch that is carried out in a manner that "will not damage the quartz substrate".

Regarding inherency, Applicant states:

"it is certainly not inherent in Musil that the transmission of the quartz material be substantially increased while the thickness of the quartz material is substantially unchanged. This limitation may be possibly present, but it is obviously not necessary since the Musil reference specifically mentions an example where the limitation is not present".

The examiner notes that when making a determination regarding inherency, the test is not that every single embodiment of a reference inherently possesses a particular feature, but rather, to establish inherency, there must be at least one embodiment that does inherently possess the particular feature.

Furthermore, "similar processes can reasonably be expected to yield products which inherently have the same properties."¹ And while the Inherency-burden is normally on the examiner to provide a basis in fact and/or technical reasoning to reasonably support a determination of inherency², where functional language is used in a process, the burden shifts to applicant to establish that the reference does not inherently function in the manner required by the claims.³

Claim Rejections - 35 USC § 102

¹ *In re Spada* 15 USPQ2d 1655 (CAFC 1990); *In re DeBlauwe* 222 USPQ 191; *In re Wiegand* 86 USPQ 155 (CCPA 1950)

² *Ex parte Levy* 17 USPQ 1461, 1464 (BPAI 1990); *Ex parte Skinner* 2 USPQ 2d 1788 (BPAI 1987); *In re King* 231 USPQ 136 (Fed. Cir. 1986); *W.I. Gore & Associates Inc. v. Garlock Inc.* 220 USPQ 303 (CCPA 1983); *In re Oerlich* 212 USPQ 323 (CCPA 1981); *In re Wilding* 190 USPQ 59 (CCPA 1976); *Hansgrig v. Kemmer* 40 USPQ 665 (CCPA 1939)

³ *Ex parte Bylund* 217 USPQ 492 (PO BdPatApp 1981); *In re Hallman* 210 USPQ 609 (CCPA 1981)

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-3, 6-8, 10-12, 21 and 22 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication 20030047691 of Musil et al. (hereinafter, Musil).

Musil teaches repairing opaque defects of a lithography mask by directing an electron beam and XeF_2 toward a region of a quartz substrate into which Ga^+ ions have been implanted (see paragraphs [0047]-[0049]).

Regarding the process parameter limitations of claims 10-12, 18 and 19 and the process results limitations of claims 6-8, 21 and 22, it is noted that Musil does not explicitly teach these limitation. However, Musil provides information regarding related operational parameters and Musil teaches process results indicating that Musil operates in a manner that meets these limitations. Specifically, Musil teaches repairing a mask by electron beam assisted etching in a manner such that the quartz substrate is not damaged. As Musil obtains results that meet the process result limitations of claims 6-8, 21 and 22, it follows that the operational parameters used by Musil are comparable to those of claims 10-12, 18 and 19. Additionally it is noted that Musil teaches minimizing the amount of electron charge used to remove defects ([0053]).

Claims 1-12, 21 and 22 are rejected under 35 U.S.C. 102(e) as being clearly anticipated by US Patent Application Publication 2004/0151991 of Stewart et al.

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Stewart incorporates by reference the teachings of Musil. Additionally, Stewart teaches (with emphasis added):

"[0036] Mask repair can use both electron beam and ion beam etching and deposition. In embodiments in which it is not desired to use ion implantation staining, an electron beam repair is preferred because it eliminates ion implantation. For example, MoSi and TaN.sub.2 absorber material can be etched using an electron beam and an etchant gas, such as XeF.sub.2, as described in **U.S. patent application Ser. No. 10/206,843 for Electron Beam Processing," by Musil et al., which is hereby incorporated by reference.** The gallium beam can be also be used for etching chrome, and **the gallium-implanted layer can be removed using the gas assisted etching using the ion beam or an electron beam.**"

[0038] A strategy to repair a particular defect can include multiple stages, using combinations of ion, electron or lasers. For example, **an ion beam can be used to remove an opaque defect and then an electron beam can be used to etch a layer of gallium-implanted quartz using XeF.sub.2 as post processing to restore transmission.**

[0044] In accordance with various repair strategies that can be used, a work piece can be processed using an electron beam or an ion beam. The effects of **ion implantation can be:** 1. avoided by using an electron beam for some operations; 2. used constructively to provide desired optical properties; or 3. **eliminated by removal of the implanted layer.** Multi-stage operations that use a combination of laser beams, ion beams, and electron beams can speed operations and reduce defects. For example, **an ion beam can be used to process a defect and then an electron beam can be used to remove the effects of the ion beam.**

The references applied above have a common inventor with the instant application. Based upon the earlier effective U.S. filing date of these references, they constitute prior art under 35 U.S.C. 102(e). These rejections under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the references was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Allan Olsen
Primary Examiner
Art Unit 1763